REMARKS

CLAIM REJECTION UNDER 35 U.S.C. § 103

Claims 9, 11 – 13, 15 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stemmler, U.S. Patent 5,022,295, in view of Kalwaites, U.S. Patent 3,881,381 and Larsen et al., U.S. Patent 5,948,566.

Stemmler discloses a rotary punch apparatus for producing profiled and straight cuts on moving webs or flat individual articles of foil or paper "wherein the punching device is brought completely to a constant temperature which is above the highest operating temperature which obtains under operating conditions, and is maintained at that temperature" (col. 3, lines 11 – 15).

The purpose for heating the rotary punch to a temperature above the highest operating temperature under operating conditions is to maintain the punch components dimensionally stable so as to maintain constant the cutting arc of the cutting tool from the opposed tool for punching foil or paper which is "paper thin".

Applicant's apparatus for continuously cutting sticky freshly pasted lead or lead alloy mesh strip devoid of paper, on the other hand, comprises a cutting roll and anvil roll journaled for rotation in a supporting frame with an index mechanism and conveying means for continuously passing freshly pasted mesh strip therebetween, with heating means for heating cutting blades, index mechanism and opposed rolls to an operating temperature within a specified range of 160 to 300°C, preferably 180 to 210°C. The freshly pasted mesh strip not only has sticky exposed surfaces but also is relatively thick, i.e., up to 0.12 inch thick which is about thirty times the thickness of foil or paper, and is saturated with sticky paste.

It is respectfully submitted that the device of Stemmler, for punching paper and foil so thin at about 0.004 inch thickness that the device has to be heated to a temperature above its highest operating temperature to maintain dimensionally stable cutting conditions, is not capable at all or feasible for being used with expanded, punched or cast

relatively thick three-dimensional unpapered mesh having its interstices filled with a sticky paste and would immediately fail. The heating of applicant's cutting apparatus to a temperature above the highest operating temperature would be "wasteful of heat energy, require greater compensation factors for thermal expansion of the apparatus and unduly reduce the life expectancy of the die support bearings. In addition, die temperatures in excess of about 210°C present a possible safety hazard in that moisture in the paste can be vaporized and expelled rapidly by 'paste spitting'. However, it may be possible to operate above 210°C to above 300°C under certain operating conditions." (applicant's specification, page 7, first paragraph)

The Stemmler reference teaches a device having tempering means adapted to operate at a temperature above its highest operating temperature. Heating means for heating applicant's apparatus above 300°C would not only waste energy but would cause undesirable thermal expansion of the apparatus and unduly reduce the life expectancy of support bearings. Also, a safety hazard could be created due to vaporization and expulsion of vaporized paste.

Further, Stemmler does not disclose an apparatus including an index mechanism and conveying means for continuously passing the mesh strip between opposed rolls and means for heating cutting blades, index mechanism, cutting roll and opposed anvil roll to a temperature within specified operating temperature range.

Kalwaites is cited to show it is old and well known in the art to use similar workpieces as Stemmler with conveyor and a specific temperature of 160 to 300°C, more specifically 280 to 425°F, depending upon the specific workpiece for the purpose of facilitating movement of the workpiece between forming rolls as wells facilitating forming of the film.

Kalwaites discloses a method and apparatus for manufacturing oriented net-like materials from intersecting polyolefin filaments such as high-density polypropylene by stretching the polyolefin filaments at a temperature in the range of 280 to 425°F (138 to

218°C) and then by applying compressive and shearing forces to form a pattern of intersecting filaments on a forming roll by cooling the hot formed material while still on the forming roll to a temperature below 240°F (116°C) for polypropylene and below 220°F (104°C) for polyethylene (col. 5, lines 4 – 16). The Kalwaites temperatures are below 116°C or 104°C while forming the stretched polyolefin intersecting filaments into reticulate sheet material. Thus Kalwaites not only does not teach or suggest applicant's claimed ranges of 160 to 300°C or 180 to 210°C but in distinction teaches inoperative temperatures below 116°C or below 104°C for forming which are substantially below applicant's claimed operative lower temperature limit of 160°C.

It is stated on page 7, lines 1 and 2 of the present application that, "Die temperatures in the temperature range between 80 to 150°C are not effective, as battery paste will stick to the die surfaces". Thus the Kalwaites patent teaches heating means having a clearly inoperative temperature during contact of the workpiece with the forming roll.

In that the punching device of Stemmler differs structurally and functionally from applicant's cutting apparatus and applicant's heating means are operative at different temperature ranges than disclosed in both Stemmler and Kalwaites, which teach means for heating to inoperative temperatures either above or below applicant's critical heating ranges, it is respectfully submitted that applicant's cutting apparatus is both novel and unobvious over these references.

Larsen et al. disclose a method for making paper-shrouded industrial size battery grids (0.060 to 0.120 inch thickness) having "a bottom absorbent paper layer 62 from a roll 64 is positioned between the strip 50 and the surface of the conveyor belt 64" (col. 7, lines 26 – 28) and "as shown in FIG. 3, a top absorbent paper layer 72 unwinds from roll 74 and is fed onto the upper surface of the pasted strip" (col. 7, lines 50 – 53). It is stated (col. 7, lines 58 – 62) "...it is preferred to first carry out the plate parting step because the paper present on either side of the pasted grid mesh prevents the cutters used for plate cutting from removing too much paste; and, also, the active material is soft and less susceptible to

cutter damage prior to cutting.".

Larsen et al. thus disclose a method similar to applicant's prior art method using top and bottom paper layers specifically to avoid sticking of paste to the cutting mechanism. There is no motivation in Larsen et al. to heat the cutting mechanism to a predetermined elevated temperature to obviate sticking of paste to the cutting mechanism.

The reference to an index ring (col. 7, lines 65 – 67) is in the context of a conventional prior art apparatus having the very disadvantages applicant's apparatus is intended to avoid.

Claims 9, 11 – 13, 15 and 17 are rejected under 35 U.S.C.103(a) as being unpatentable over Larsen et al., U.S. Patent 5,948,566, in view of Stemmler, U.S. Patent 5,022,295, and Kalwaites, U.S. Patent 3,881,381.

Larsen et al. relate to covering both sides of pasted mesh with absorbent paper layers and then parting (dividing) the shrouded mesh to avoid removal of too much paste. The heating means referred to in Larsen et al. relates to flash drying of plates after parting to remove 15 – 20% surface moisture from the paste, followed by curing. The heating means is located downstream of the cutting mechanism and clearly does not assist the cutting operation in view of the need for paper covers on both sides of the pasted mesh strip.

Kalwaites, discussed above, does not disclose applicant's means for a critical temperature range and would teach away from the applicant's lower operative limit.

Stemmler, also discussed above, clearly is not capable of being used with thick, unpapered, sticky, freshly pasted expanded, punched or cast lead or lead alloy mesh strip, and teaches away from applicant's apparatus, and would fail.

With regard to applicant's response to arguments, neither the apparatus of Stemmler nor of Kalwaites would be physically capable of being used with unpapered, sticky, freshly pasted expanded, punched or cast lead or lead alloy strip due to the relative

thickness of applicant's mesh strip compared to the thickness of thin paper, foil and stretched polyolefins.

It is stated in the Manual of Patent Examining Procedurep (MPEP) in Chaptr 700 (page 700 – 46):

> *"To establish a prima facie case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art and not based on applicant's disclosure. In re Vaeck, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). See MPEP §2143 - §2143.03 for decisions pertinent to each of these criteria."*

There is no suggestion in the cited art of the desirability of combining *inter alia* a cutting roll with cutting blades mounted thereon and an opposed anvil roll for cutting thick and sticky three-dimensional freshly pasted lead or lead alloy strip therebetween into equal lengths, an index mechanism and conveying means for continuously passing the pasted lead or lead alloy mesh strip between the opposed rolls, and heating means for heating the cutting blades, index mechanism and the cutting roll and opposed anvil roll to a specified temperature in the range of about 160 to 300°C.

Both Stemmler and Kalwaites disclose apparatus for cutting relatively thin foil or paper, the former at a non-disclosed elevated temperature above normal operating temperature for dimensional stability and the latter at a temperature below 116°C to less than 104°C. Larsen et al. disclose a prior art apparatus for producing expanded mesh using paper covers which has all the disadvantages of the prior art which applicant's apparatus

avoids. Larsen et al. disclose the use of an indexing mechanism in the context of a prior art apparatus which makes no reference or suggestion whatsoever to heating means operative with the cutting means. Thus there is no suggestion or motivation in any of the references to combine the reference teachings to arrive at the combination comprising the claimed apparatus.

As to "reasonable expectation of success", the objective evidence of Mr. Thomas Lester Oswald indicated, in the last sentence of paragraph 7 of his Declaration, that based on his forty-five years of experience and testing of prior equipment, that a person skilled in the art would not expect sticking of paste to cutting surfaces would be overcome without the use of paper barriers. In this respect, it is respectfully pointed out that the Larsen et al. patent application was filed as recently as September 4, 1997 and the patent issued September 7, 1999. Larsen et al. thought it was necessary, in the apparatus embodiments shown in Figures 3 and 6, to cover both sides of pasted grid mesh with paper to prevent too much paste adhering to the cutters (col. 7, lines 56 – 62 and col. 10, lines 11 – 19).

The prior art references do not teach or suggest all the claim limitations. The combination of heating means for heating cutting blades, index mechanism, cutting roll and anvil roll is not taught and is not suggested in the references. In addition, heating means for operating in the temperature range of at least 160°C to 300°C is not taught or suggested; Kalwaites disclosing a temperature below 104°C, well below applicant's lower temperature limit of 160°C, Stemmler disclosing apparatus having heating means operating at a temperature above normal operating temperatures, and Larsen et al. having no heating means at all for the cutting mechanism.

It is believed the claims on file are clearly patentably distinguished over the cited references and favourable consideration and allowance of claims 9, 11 – 13, 15 and 17 accordingly are earnestly solicited.

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